

**A BIBLIOGRAPHY OF THE "GHOST FUNGUS",
Pleurotus nidiformis (Berk.) Sacc.**

by
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Throughout temperate Australia, in all but the more arid parts, occurs a large white-spored agaric that is well known for the luminescence of its fruiting bodies. The toughly fleshy sporophores (about 2–6 inches wide) are borne in dense clusters up to 1 foot broad—always against the base (or dead stump) of a tree. Individual pilei are smooth, sometimes lobed and shell-like, with excentric, distorted or lateral stipes and rather distant, long-decurrent, often somewhat creamy gills. In early stages they often display sooty purplish or bronze-brown colourations that may pale to suffusions of mauve, pink or yellow on a whitish ground, as the pileus expands. Mature specimens are sometimes almost entirely white, lacking the characteristic tints. The pronounced odour is pleasant and bread-like. Luminosity of the gills is at first so bright that one may read newsprint held close to a sporophore, and in cool weather the light will last for about a week with gradually diminishing intensity.

Eucalypts are the usual hosts, but this fungus has also been found in association with *Leptospermum*, *Banksia* and *Grevillea* species; in June 1965† it appeared at the base of a living Plane Tree (*Platanus acerifolia*) outside the Royal Botanic Gardens, Melbourne. Fruiting bodies may be found after good rains at almost any season, although chiefly during autumn and winter. In Victoria they have been observed in such diverse habitats as Wyperfeld and Mount Buffalo National Parks, the former mallee tract with an annual rainfall of only 13 inches and the latter subalpine area (at \pm 4,600 feet) with more than 60 inches.

The earliest account of an Australian occurrence, but without any botanical name, would seem to have been in a letter to Sir William Hooker by James Drummond of Toodyay, W.A., on 2 July 1841. This was published in Hooker's *London Journal of Botany* (1842). Drummond had found the agaric growing on the "stump of a *Banksia* tree near the jetty at Perth", and had seen it for the first time about 6–7 years previously; when he showed a glowing specimen to some aborigines, at night, they were afraid, crying "Chinga!" (i.e. spirit). The following year (1843) Hooker published Drummond's notes on a further occurrence near the Vasse River (far south-west) and in 1844 Rev. M. J. Berkeley described one of Drummond's collections under the name *Agaricus nidiformis*. Thereafter, during the next 30 years, Berkeley described what are almost certainly environmental forms of the same toadstool—from Western Australia, Tasmania and Victoria—under four other names, viz. *A. lampas* (1845), *A. phosphorus* (1848), *A. candescens* and *A. illuminans*

* National Herbarium of Victoria.

† And again in May 1966.

(both 1873). P. A. Saccardo (1887) was the first to refer these five entities to the genus *Pleurotus*, Berkeley having regarded the latter as a sugbenus under *Agaricus*.

Subsequent workers have variously synonymized one or more of the names, and Bresadola (1928) went as far as to express the belief that all Australian fungi under the names *P. lampas*, *P. candescens*, *P. illuminans* and *P. phosphorus* were conspecific with European *P. olearius* (DC. ex Fr.) Gillet, of which Saccardo had remarked (1887, p. 346): "*Lamellarum phosphorescentia maxime insignis et antiquitus celebratus*". *Pleurotus nidiformis* (syn. *P. lampas* &c.) is certainly congeneric (and perhaps conspecific) with *P. olearius* which Dr. Rolf Singer (1962) has placed in V. Fayod's genus *Omphalotus* (1889)—having subglobose spores (not cylindric as in a true *Pleurotus*) and a less irregular trama. Members of *Pleurotus* are edible, non-luminous and have a creamy spore-print, whereas *Omphalotus* is reputedly poisonous, always luminescent and with pure white spore-print. Singer (1962) admits but "one 'linnaeon' which should be divided into several races (geographical and/or ecological)". *O. olearius* (DC. ex Fr.) Singer of southern Europe appears mostly to be cyathiform and umbilicate, red-brown or blackish at first, then yellowish with the gills yellowish or rhubarb-coloured. Until Australian material can be carefully compared in a living state with *Omphalotus olearius*, one would be ill-advised to make the combination "*O. nidiformis*", and at present it seems desirable to retain for our 'Ghost Fungus' the familiar name *Pleurotus nidiformis*, even if strictly incorrect on modern taxonomic grounds.

In the following bibliography, references and comments in parenthesis have been arranged chronologically:

1815.

CANDOLLE, Augustin P. de—*Flore Française* 6: 44–45 [Description in French of *Agaricus olearius*, with remarks on its great variability of form, the stipe being lateral, excentric or rarely central].

1840.

GARDNER, George, and BERKELEY, M. J.—Description of a new phosphorescent species of *Agaricus*. *J. Bot., Lond.* 2: 426–28 [*A. gardneri* described, the type from rotting palm fronds in Goyaz Province, Brazil].

1842.

DRUMMOND, J.—Letter of 2 July 1841, reproduced in *Lond. J. Bot.* 1: 216–17 [First account of luminous fungus in Australia, on a *Banksia* at Perth, before any name had been applied. Drummond had observed, 6–7 years previously, luminescent agarics growing on tree-stumps in Western Australia].

1843.

- DRUMMOND, J.—Letter of 26 June 1842, reproduced in *Lond. J. Bot.* 2: 173 [Report of a further occurrence of luminous toadstools, on dead trunk of *Eucalyptus occidentalis* near the Vasse River, W.A.].

1844.

- BERKELEY, M. J.—Decades of Fungi (I). *Lond. J. Bot.* 3: 185 [Original description of *Agaricus nidiformis*, from a gigantic, terrestrial, cup-shaped specimen 16 inches broad, said to come from "Swan River". Berkeley remarks: "Allied to *Ag. ostreatus*, but a far more magnificent species; when fresh it must be one of the finest of the genus".].

1845.

- BERKELEY, M. J.—Decades of Fungi (III–VII). *Lond. J. Bot.* 4: 44 [Original description of *Agaricus lampas*, based on J. Drummond's collection n. 109 from "stems of sickly but living plants of *Grevillea Drummondii* Preiss near the roots". The author states that it is "allied to *Ag. nidiformis* Berk., which is also a phosphorescent species".].

1848.

- BERKELEY, M. J.—Decades of Fungi (XX). *Lond. J. Bot.* 7: 572 [Original description of *Agaricus phosphorus* from "roots of trees" in Tasmania, but without more precise locality. Berkeley states: "It is certainly distinct from the two phosphorescent Australian species, *A. nidiformis* and *A. lampas*, described in my first Century".]

- TULASNE, L. R.—Sur la phosphorescence spontanée de l'*Agaricus olearius* DC. &c. *Ann. Sci. nat. sér. 3*, 9: 338–362, t. 20 [The "Champignon de l'Olivier", *Agaricus olearius*, is fully described in French and sundry explanations for the cause of luminosity reviewed. According to various previous writers, this agaric has been found on *Carpinus*, *Castanea*, *Ficus*, *Populus*, *Quercus*, *Robinia*, *Syringa* and *Viburnum* species].

1873.

- BERKELEY, M. J.—Australian fungi, received principally from Baron F. von Mueller and Dr. R. Schomburgk. *J. Linn. Soc. (Bot.)* 13: 157 [Original descriptions of *Agaricus illuminans* from "Australia" and *A. candescens* from dead wood at Melbourne, Vic., the epithets being ascribed to F. Mueller. Under *A. candescens*, Berkeley observes: "Very near *A. lampas* Berk., Swan River (= *A. noctilucus* Berk., Tasmania), but has thinner gills. I cannot, from the dry specimens, distinguish *A. pyrogenus* Müll. from Yarra Yarra, Victoria. . .

or *A. luminans* Müll., Melbourne". *A. loctilucus* is a 'nomen nudum', having no nomenclatural standing, and this is the first time that a luminous fungus is recorded for Victoria].

1885.

TISDALL, H. T.—Fungi of country east of Mt. Baw-Baw. *Vict. Nat.* 1: 171 (Mar.) [Description of a colony of sporophores under the name *Agaricus lampas*].

1887.

SACCARDO, P. A.—*Sylloge Fungorum* 5: 346, 352, 357–58 [Latin descriptions are given of *Pleurotus olearius*, *P. gardneri*, *P. illuminans*, *P. nidiformis*, *P. lampas*, *P. candescens* and *P. phosphorus* and new combinations under the genus *Pleurotus* are effected for all but the first species].

1892.

COOKE, M. C.—*Handbook of Australian Fungi* 31–32 [*Agaricus gardneri*, *A. illuminans*, *A. lampas* and *A. candescens* are listed as phosphorescent and briefly described. The Brazilian *A. gardneri* is now attributed also to Queensland on "half putrid fronds of palms"—the first luminous toadstool to be recorded for that State. Cooke fails to say that *A. phosphorus* is luminous too, and he mis-spells the epithet as "phosphoreus" in which he has been followed by some subsequent writers. Distribution of *A. illuminans* is extended from Victoria to New South Wales and Queensland].

1895.

McALPINE, D.—*Systematic Arrangement of Australian Fungi* 10–13 [*Pleurotus candescens*, *P. gardneri*, *P. illuminans*, *P. lampas* and *P. phosphorus* are listed as phosphorescent and very briefly described. *P. nidiformis* is also listed, as for W.A. only].

1901.

McALPINE, D.—Phosphorescent fungi in Australia. *Proc. Linn. Soc. N.S.W.* 25: 548–558 [The six entities listed in 1895, q.v., are all retained as distinct species; the cause of phosphorescence is discussed and a bibliography given. *Pleurotus candescens* is described in detail, its variability being stressed].

1904.

BAGE, Freda—Notes on phosphorescence in plants and animals. *Vict. Nat.* 21: 93–104 [References are made, p. 94, to *Agaricus olearius* in Italy and to the abundance of *Pleurotus candescens* against tea-tree trunks on the Mornington Peninsula, Vic. A bibliography of 38 authors concludes the paper].

1907.
EWART, A. J.—Notes on the phosphorescence of *Agaricus* (*Pleurotus*) *candescens*. *Vict. Nat.* 23: 154, 174 [Discussion on chemistry].
1913.
BAILEY, F. M.—*Comprehensive Catalogue of Queensland Plants* 717 [*Agaricus illuminans* is retained as a distinct species for Queensland, but *A. gardneri* is now dropped from the list of fungi—see Cooke, 1892].
1919.
WHITE, C. T.—Luminous fungi. *Qd Agric. J.* new ser. 12: 33–34, t. 3 [Brief discussion on Australian species and a good photograph of *Pleurotus lampas*].
WILLIAMSON, H. B.—*Vict. Nat.* 36: 2 (May) [Remark on exhibit of fresh luminous example of *Pleurotus candescens* from Clayton, Vic. Also, on p. 3, note on exhibit by Miss G. Nokes of large specimen from Sandringham].
1928.
BRESADOLA, J.—*Iconographia mycologica* 6: 285 [The belief is expressed that Australian fungi under the names *Pleurotus lampas*, *P. candescens*, *P. illuminans* and *P. phosphorus* are nothing more than *P. olearius* of southern Europe].
1934.
CLELAND, J. B.—*Toadstools and Mushrooms and other Larger Fungi of South Australia* 1: 88–89 [Detailed botanical description of *Pleurotus lampas* (Berk.) Sacc. which is given an Australia-wide distribution. *P. candescens* and *P. phosphorus* are cited as "probable synonyms" and *P. nidiformis* as a "doubtful synonym"].
WILLIS, J. H.—The Agaricaceae or "Gilled Fungi". *Vict. Nat.* 50: 293 (April) [Popular description of *Pleurotus nidiformis*].
1937.
HAMILTON, A. G.—*Bush Rambles*: 146–147 [Popular description of toadstool and its light, without mention of a botanical name].
1939.
OPPERMAN, A. E.—*Wild Life, Melb.* 1: 30 (June) [Photo. with brief note].
GREVIS-JAMES, F. W.—*Wild Life, Melb.* 1: 19 (Aug.) [Illustration of glowing sporophore reflected in a mirror].
1941.
WILLIS, J. H.—*Victorian Fungi* 47–48 [Popular description under name *Pleurotus lampas*].

1946.

GREVIS-JAMES, F. W.—*Wild Life, Melb.* 8: 128 [Same illustration as that reproduced in Aug. 1939 (q.v.)].

1948.

WASSINK, E. C.—Observations on the luminescence in fungi, I, including a critical review of the species mentioned as luminescent in literature. *Rec. Trav. bot. néerl.* 41: 150–211, t. I, fig. 12 [A very full account of luminous fungi in general, with 123 literary references. On p. 171, it is concluded that Australian populations constitute a geographical variant of *Pleurotus olearius*].

1950.

FOOT, Allan—*Wild Life, Melb.* 12: 481, 504–506 [Popular account of *Pleurotus lampas* with three excellent photos., including one made by its own light—with exposure of one hour].

WILLIS, J. H.—*Victorian Toadstools and Mushrooms* 47–48 [Popular account under the name *Pleurotus lampas*].

1953.

WILLIS, J. H.—The Archipelago of the Recherche. *Aust. geogr. Soc. Rep.*, Part 3 (Plants): 33 [*Pleurotus lampas* is synonymized under *P. nidiformis*].

1956.

LAMBERTON, J. A.—Chemical constituents of the luminescent fungus *Pleurotus lampas* Berk. *Aust. J. Chem.* 9³: 433–36 (Discussion of a chemical examination made on luminous and young non-luminous sporophores, and suggestion that luminosity may be due to luciferin-like substances).

1957 (June).

WILLIS, J. H.—*Victorian Toadstools and Mushrooms*, ed. 2: 53–54 [Popular account of *Pleurotus nidiformis*].

1958.

WILLIS, J. H.—*Aust. Encycl.* 4: 232 [Note on luminosity of *Pleurotus nidiformis*].

1962.

SINGER, Rolf—*The Agaricales in Modern Taxonomy*, ed. 2: 224–26 [Discussion on genus *Omphalotus* Fayod, to which *Pleurotus olearius* is transferred; and suggestion that Australian and other luminous agarics, hitherto assigned to *Pleurotus*, may be "geographical and/or ecological races" of *O. olearius*].

1963.

STEWART, R. L.—*Pleurotus lampas* near Marysville. *Walkabout* 29⁷: 22 (July) [Photograph only].

WILLIS, J. H.—*Victorian Toadstools and Mushrooms*, ed. 3: 53–54 (Dec.). [Details as for Willis 1957 (q.v.)].